DOCUMENT RESUME

ED 387 849 CS 509 062

AUTHOR McHenry, Lynnea; Bozik, Mary
TITLE Communicating at a Distance: A Study of Interaction in a Distance Education Classroom.
PUB DATE Apr 95
NOTE 31p.; Paper presented at the Annual Meeting of the Central States Communication Association (Indianapolis, IN, April 19-23, 1995).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Classroom Communication; Communication Research; Computer Assisted Instruction; *Distance Education; Electronic Classrooms; Higher Education; High Schools; *Interactive Television; *Student Attitudes; *Teacher Student Relationship
IDENTIFIERS Fiber Optics; *Interactive Teaching; *Iowa; Research Suggestions; Technology Integration

ABSTRACT

Iowa's first-in-the-nation statewide fiber-optics telecommunications network is bringing both excitement and concern to educators. One application of the fiber-optics network is the offering of college courses through live, interactive television instruction. The teacher in the origination site classroom is linked with students in one or more remote site locations through a 2-way audio and video system. A study explored the communication that takes place between the persons and the classrooms during one of these college courses, specifically examining what it is like to be a student participant in an interactive television classroom. A college classroom with 20 students served at the origination site; four remote high school classrooms (with between one and five students in each room) served as the receive sites. Classroom observation and individual group interviews were guided by three research questions: (1) what are the influences on the communication that takes place between the actors? (2) how does technology influence the interaction in the classrooms? and (3) does the distance have any other effects on communication in or between classrooms? Results took the form of five primary communication themes: expectations of and problems with technology; problems associated with distance; perceptions of nontraditional students; encouraging the use of technology; and encouraging student interaction. Further exploration is needed in communication-related areas such as classroom climate, apprehension, interaction, feedback, and learning styles. (Contains 12 references.) (TB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 387 849

COMMUNICATING AT A DISTANCE:

A STUDY OF INTERACTION IN A DISTANCE EDUCATION CLASSROOM

A paper submitted for Central States Communication Association

Communication Education Division

July 1, 1994

by

Lynnea McHenry

Hawkeye Community College

Waterloo, IA 50704-8015

(319) 296-2320

and

Mary Bozik

University of Northern Iowa

Cedar Falls, IA 50614-0357

(319) 273-2048

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

M. Bozik

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

CS509062

Running head: COMMUNICATING AT A DISTANCE

BEST COPY AVAILABLE

Abstract

Iowa's first-in-the-nation statewide fiber-optics telecommunications network is bringing both excitement and concern to educators. Ultimately, the network is intended to link the state's major learning centers, libraries, and government agencies, providing all Iowans with access to these resources through high quality data, voice, and interactive video transmission.

One application of the fiber-optics network is the offering of college courses through live, interactive television instruction. The teacher in the origination site classroom is linked with students in one or more remote site locations through a two-way audio and video system.

This research explores the communication that takes place between the persons and the classrooms during one of these college courses. It explores -- from the students' perspectives -- what it is like to be a participant in an interactive television classroom. Classroom observation and individual and group interviews were guided by three research questions:

1: What are the influences on the communication that takes place between the actors?

2: How does technology influence the interaction in the classrooms?

3: Does the distance have any other effects on communication in or between the classrooms?

Communicating at a Distance:

A Study of Interaction in a Distance Education Classroom

"Ready or not, here it comes!" reads the headline of the Iowa State Education Association's ISEA Communique news publication (ISEA, 1993, October). What has come to Iowa is "the nation's first statewide fully interactive video fiber-optic network" (p. 1). According to the Iowa Communications Network (ICN) promotional brochure, the network "is designed to provide all Iowans with ready access to the rich resources of our state's major learning centers, libraries and government agencies.... Everyone in Iowa will be within 20 minutes of an ICN end user site" (p. 1).

As of Spring 1994, the backbone of the system is complete, with all 99 counties hooked into the network through 54 high schools, the state universities, community colleges, and two private colleges. The last phase of construction will eventually include 400 schools and libraries (Hartman, p. 1).

Background

Although Iowa is the first state with such an extensive fiber-optics network, it is not the only one to explore distance learning through technology. According to Mary Anderson, Research Consultant to the Iowa Star Schools Project, "Some form of fiber-optics distance education is either ongoing or under construction in 11 states" (personal communication, July 13, 1994). Other systems, using satellite and microwave transmission, have been in place to varying degrees across the nation. The United States Congress Office of Technology

Assessment (1989) reported that "virtually every State is interested in using telecommunications to serve education, actively planning for distance education, already administering a statewide plan or system, or has local distance learning projects in place....States are also beginning to look beyond their borders to share resources and respond to national programs" (U.S. Congress, 1989, p. 155).

Vice President Gore, speaking to communication industry leaders in January of 1994, "restated the administration's desire to ensure that all consumers, including poor and rural Americans, will have access to the educational opportunities and information on the superhighway" (Vice President Gore, p. 4).

Developments in distance learning are being driven by a number of factors. Some of the most obvious, for secondary schools, are the state-mandated curriculum changes and increased requirements for graduation, mandates to better serve both rural and urban underserved populations, and dwindling financial resources. "Increased standards have forced schools to find ways to offer more extensive and intensive curriculum. Small and rural districts unable to meet the standards fixed by states have traditionally been forced to consolidate. Today technology provides an alternative" (U.S. Congress, 1989, p. 111).

Trying to meet increased educational needs with decreasing resources has served as an impetus for developing this technology. "The cost effectiveness of distance learning is that a teacher can reach a number of students -- ten, twenty, even thirty -- in several different districts while teaching once;

whereas the same teacher would not be able to teach three or four students in one location at a time, five or ten times over. The cost of such time and travel would be prohibitive" (Rezabek, 1988, p. 1).

In order to address these issues, colleges are also turning to live interactive television instruction to increase the number and types of course offerings than would otherwise be available. Live instruction through a telecommunications system can be "the next best thing to being there." In some cases, it is even better than being there (that is, the origination site of the instruction) because of the distance the student would have to travel. Accessing education through a technological system can provide the benefits of a college education to those whose geographic or economic situation would otherwise make that education impossible.

As the system evolves, hundreds of questions remain to be answered. This research explores the communication that takes place in and between the classrooms and persons in one of these college classrooms. As the various entities examine the future of the fiber-optic system, it will be essential not only to encourage input from educators, but from students. This research explores the students' perspectives -- aiming to discover from a learner's point of view, what it is like to be a participant in the interactive television classroom. The study was designed to allow students to share what worked well for them and to tell us what we, as educators, can do to make it work better.

Review of the Literature

Duning, et al. (1993) use the term "interactive educational telecommunication system" to describe "a system that allows for some form of two-way communication between users, most often as real time communications" (p. 273). In this research the communication takes place through a two-way video and audio fiber-optics network. The teacher in a home classroom is linked with students in four remote sites.

The communicative significance of this context is highlighted by the emergence of a major pedagogical concern with the role of interaction in distance education. This concern for interaction is a recurring theme in the literature. "Quality distant education is dependent upon the interaction and participation of the learners, similarly as in traditional face-to-face instruction. It is essential that the distant educator purposefully designs this essential ingredient into the instructional program" (Kruh & Murphy, 1990, p. 6).

In an analysis of audio teleconferencing, Garrison (1990) concluded that "...education, whether it be at a distance or not, is dependent upon two-way communication. There is increasing realization in the educational community that simply accessing information is not sufficient....information must be shared, critically analyzed, and applied in order to become knowledge" (p. 13).

"As live interactive video instruction grows throughout the country there is increasing interest in the value and necessity for instructor-student interaction" (Threlkeld, Behm, & Shiflett,

1990, p. 80). In an attempt to answer the question, "Is the level of student interaction related to student course outcomes or attitudes?" Threlkeld examined data from a study of high school students taking university college credit courses via a one-way video and two-way audio Instructional Television Fixed Services (ITFS) network through California State Polytechnic University. Students were divided into two categories based on responses to a questionnaire. "High interactors" were those who said they interacted with the instructor one or more times per week and "low interactors" were those who said they interacted less than once per week. "Those students who described themselves as more interactive during the live, televised classes are students who tended to perform better in the class, like the course more, and feel more a part of the class than do low interactors. While these results do not suggest causation, they do suggest interaction is highly related to those positive performance and attitudes" (Threlkeld et al., 1990, p. 81).

Threlkeld also reports on a survey of assistant superintendents in 400 school districts who were surveyed about their perceived needs for distance learning in their districts. Out of the seven characteristics of importance, the average rating of the 240 respondents placed "the ability for live on-air interaction with an instuctor" second only to "the need for adequate library sources" (Threlkeld et al., 1990, p. 82).

Behm (Threlkeld et al., 1990) surveyed three groups of students taking distance learning courses through San Diego State University: high school students, corporate professionals in the

workplace, and elementary and secondary teachers viewing graduate courses via home cable television. All three groups had the capability of live, talk back interaction.

Behm found that the adult learners did not rate the importance of interaction as highly as the high school students. "Although these results contradict the generally held view that, at the least, the ability to interact during class is of great importance to all distance education students, the results support the view of Phillip Swain of Purdue University. Swain reported...that interaction or the ability to interact is only important if instructors are well versed in its use and the conveyance of the particular subject matter is enhanced by interactive teaching methods" (Threlkeld et al., 1990, p. 83). In Behm's study, adult learners rated prompt feedback on homework and exams as more critical for success of a distance learning program.

Student perceptions of distance education have generally been found to be favorable. At Paducah Community College, in Kentucky, "entering freshman might now...work all the way through the doctoral level on one community college campus..." (O'Hara & Patton, 1992, p. 5) through such a system in cooperation with Murray State University and the University of Kentucky. Both "student and instructor attitude surveys were carefully reviewed and found to be uniformly positive" (O'Hara & Patton, p. 3). O'Hara & Patton do not give the details, but state that their "research indicates that students at remote sites perform as well or better than those at the primary teaching sites, and they

enjoy all the benefits of the classroom without the hassles of commuting" (1992, p. 7).

Similar results are reported in The Eastern Iowa Community College District's (EICCD) Televised Interactive Education (TIE) Evaluation Report for the 1990-1991 school year. "As in the previous year, academically there is no significant difference between the performance of origination versus remote site students. Learning is effectively taking place" (Kabat, 1991, p. 54).

Methodology

Participants and setting

The setting for this research is a college classroom which serves as the origination site, and four remote classrooms in high schools in the surrounding area, known as receive sites. A college level course is being taught via live interactive television instruction.

The origination site has approximately 20 students. The four receive sites have between one and five students each. The students include a range of several who have come directly following high school to some who are returning after a many-year hiatus from classroom learning. The course is being taken for college credit. Those at the receive sites are likely to be from rural communities and a higher percentage of them are older students. The majority of the receive site students were female and approximately two-thirds of the origination site students were female. Most students at the origination site did not know the class was to be taught on the telecommunications system when

they registered. Students at the remote sites were aware they were be learning via television, but none had previously taken a course in this manner.

The instructor is located in the origination site classroom. Three cameras are located here. One is directed at the instructor, another at the students in the classroom, and a third is above a large, wide podium on which objects or papers can be displayed. The third camera functions as an overhead projector with the additional advantage that three dimensional objects can also be shown.

The instructor controls which camera will be displayed on the television monitors in both the origination and receive sites. In addition to the three camera angles at the origination site, the instructor may select any of the remote site classroom cameras to be displayed on the television monitors. This is done by touching the appropriate box on a touch-screen computer on the podium, beside the instructor. A small monitor is embedded in the podium to show the instructor which camera shot is being sent to the remote sites. Two monitors at the front of each classroom display the same view. One monitor at the back shows the remote site where a student is currently speaking or last spoke. Whenever a student at a remote site speaks, his or her classroom is displayed on the back monitor. The instructor can touch the screen to have that site appear for all monitors, or may initiate any site to be shown at any time.

Students at all sites are equipped with table microphones. In larger classes, two students generally share one microphone.

In order to be heard at all sites, students must push a button on the microphone before speaking. The instructor wears a lapel microphone which can be turned on or off.

Procedure

As an ethnographic study, this research focuses on the group members and their own interpretations of their experiences in the classrooms. Observations in the classrooms and interviews with students helped to refine the research focus, but the following research questions served as an initial guide.

RQ1: What are the influences on the communication that takes place between the actors?

RQ2: How does technology affect the interaction in the classrooms?

RQ3: Does the distance have any other effects on communication in or between the classrooms?

Research methods included participant observation and interviews. In addition, documents were examined to validate information. Observations were conducted over a five week period, during the middle of the semester. Seven class periods were observed, two from receive sites and five from the origination site. The intention was to observe and describe the communication that would take place between 1.) the instructor and students at the origination site; 2.) the instructor at the origination site and the students at the receive sites; 3.) the students at the origination sites and the students at the receive sites; 4.) the students at any one of the receive sites and another receive site; and 5.) between any of the students within

any one site. The observations also served to identify areas that would be appropriate to explore during interviews.

On the first visit, which was at the origination site, the primary researcher was introduced by the teacher. The researcher briefly explained that the purpose of the research was to find out what communication was like in a course being taught on the system. Brief interviews were conducted on an informal basis before and after class sessions. Additionally, several individual and small group structured interviews were conducted to cross check perceptions. Eighty-six % of the receive site students were formally interviewed as were 26% of the origination site students. These included interviews with one, two, or three students at a time. Open-ended questions were also asked in an attempt to pursue topics considered important by the interviewees. General interview topics included 1.) the interviewee's opinions and observations concerning communication in the course and 2.) the subject's perceived problems with communication and technology. The later interviews and observations served to cross check information collected earlier.

After completion of the interviews and observations, the data were examined and common elements and patterns emerged. Differences in demographics appeared. Whereas the origination site student make-up included a wide range of ages, the receive site students were generally older. Of the receive site students interviewed, all had a break in their education, many for several years. Some frustration with the younger students was expressed by more than one older student.

Jill: I think it's exciting that the college is doing this. It's "Frontierland." Everything is going to be technology-based. It's going to change the face of the world.

Mike: We'll be sitting in a room with virtual reality. They could put the chair on a ball and we'd control it!

Jill: If people don't like it, it's just because it's new.

Mike: There's no way to perfect it without using it.

Mike was asked why he didn't always use the mic and he gave two reasons. Sometimes he just didn't want everyone to hear and other times it was "too much trouble" to reach for the mic. He sits in a spot where a mic is not directly in front of him. He thought technology should be advanced enough that mics could just be on all the time.

Students at the receive sites also expressed tolerance for problems with technology with responses such as "They're learning too." One of them explained what using a mic is like at a remote site.

Beth: There's a delay of about three seconds. If the teacher starts talking before I'm done, I can't hear what's being said.

Beth is the only person at her site. She explains.

Beth: At first it was intimidating, but you get used to it. They've taught me how to turn the system off and on. Now, I think it would even be worth more money to be able to take classes here.

Two negative comments came from two origination site students. Bob, who had taken telecommunication courses at

One common theme appeared to be a tolerance for the newness of the system. Problems with the technology were not uncommon, but there was not a great deal of frustration expressed over it. Other problems with distance did appear however, as all the receive students interviewed expressed concern over the timely transfer of written materials, assignments, and/or tests.

One issue of particular interest, during the observations and in the analysis of the data, was whether there was equal interaction with the instructor from the remote students compared to students in the origination site classroom. This led to questions aimed at whether this was an important issue from the students' point of view. An attempt was made to identify ways in which the instructor encouraged interaction.

Results

Five primary communication themes emerged and are described using the students' own words, followed by an explanation of what each includes.

"Frontierland": Expectations of and problems with technology

The first two interviewees were Jill and Mike, who were interviewed together. Jill was the most vocal female in the origination site, interacting with the teacher more often than any other female. Mike usually interacted with the teacher at least once during each class period, often more. About half his comments were made without using a microphone. Both are young but have had some college experience and both sounded excited about the system.

another college, said "I don't like it. It's too impersonal." Sharon said, "I hate it. I have to wait to speak." Bob was never observed interacting with the instructor and Sharon interacted only once or twice.

During three of the seven observations, there was an initial problem with the audio transmission of a receive site. Students at the receive sites could not be heard, or a whining feedback made it impossible to hear. In the first two instances, the problem was quickly solved. In the third a technician was not immediately available, so the teacher did not try to use the audio again for the receive site until the end of class at which time the problem had been resolved. Before proceeding with class the teacher had the students wave their hands at the remote locations to indicate they could hear.

One other technological limitation surfaced.

Sara: Once I was talking to the teacher to get a question answered after class, but the system cuts off at a certain time. I think I got it mostly answered but the teacher wasn't done.

"How long will it take?": Problems associated with distance

When the class discussed turning in a project, two concerns surfaced. The instructor was unable to tell the students how long it would take for their projects to arrive, so there seemed to be a problem with deadlines for sending them in. Another concern was where to find appropriate resources. The teacher suggested college libraries, but there was apparently no method in place for students to check out material via long distance.

All students interviewed at the receive sites indicated a problem with receiving or sending paperwork.

Janet: We're not getting the literature. It could be organized better.

Sara: Not having the material is a problem -- like tests. They went over it in class and it was hard to remember how we answered the questions.

Beth: Getting our test scores was a problem. The teacher offered to show them on the screen but some didn't want the rest of the class to know. In another class, the teacher let us grade our own.

"These young kids": Perceptions of non-traditional students

Non-traditional students expressed a perception of differing goals between themselves and the younger learners. This was especially evident in an observation at one of the receive sites. At this site the adult learners occasionally interacted with the teacher by using the mics, but interacted with one another frequently without them. An interview question confirmed that this was typical.

In this dialogue, Sam, the most vocal origination site student is arguing with the teacher about how many chapters will be covered on the next test. Janet, Bill, and Karen are non-traditional students at the receive site. Students at the origination site are apparently complaining but students at the receive site can't hear what is being said. The teacher and other students do not hear any of the interactions between the remote students unless indicated: (with mic).

Janet (to researcher): We get frustrated...

Bill: I've yet to finish a book in a college class.

Janet: These young kids.

Teacher: If you want to complain, do it on the mic.

Sam: That's not fair. [A belch is heard.] That was the kid next to me that burped. It wasn't me...

Bill: Shut up and quit arguing. Welcome to college.

Teacher: Do you want...

Janet: That guy argues over everything.

Karen: (with mic) Let's take a vote. (to Janet: Can they hear me?) [There had been problems with audio earlier.]

Janet: (to Karen) Yeah. Do it.

Karen: (with mic again) Let's take a vote.

Teacher: Yes. Let's just see how far we get.

Karen: If we didn't argue so much we could just keep going.

In a later interview with Janet, she said they get frustrated because "these young kids" intentionally try to get the teacher off track. "We're here to learn."

Her perceptions were confirmed in a subsequent interview with Sam, when he said taking a class on the system meant "I can goof off to more people."

A non-traditional student in the origination site had similar perceptions. Carol has a family and works nights. She said, "I feel a little bit out of place -- with the kids in the back making jokes -- they just don't realize."

"Use the mic!": Encouraging the use of technology

"Use the mic" was a phrase used by both an apparently frustrated student and on numerous occasions, by the teacher. At a receive site, a student couldn't hear a question that was being asked. Although she said, "Use the mic" she did not use hers, so her comment was not heard at the origination site.

During an interview with another receive site student, she said, "What does bother me is when they don't use the mics. Before class the other day we heard the girls talking about how they don't like to use them, but they don't realize how important it is to us."

Many of the receive site students felt the teacher encouraged the origination site students to use their mics. One of them said, "The teacher won't answer them until they do." However, during one observation a particular instance was noted where ten interactions with the instructor were made during a ten-minute period -- only two of those were with a microphone. Although that ratio was not the norm for the entire class period, it may indicate that students at the remote sites miss more than they realize.

When students were asked why they didn't use their mics, one said that it wasn't worth the trouble of reaching for it and that sometimes he didn't want everyone to hear. He said, "I'm a blurt it out kind of guy." Where he sat, three people were actually sharing a mic. Of the five other students who interacted most frequently two males generally shared one mic, one male had his own, and the two females each had her own. One of these is

Carol, a night worker who felt a little out of place. She said, "At first I was kind of scared, but I decided I was going to take this seriously. Sometimes I don't use it and [the teacher will] say to. I don't use it as much as I should."

The one female who said she "hated it" because she felt she had to wait rarely interacted. The male who said he didn't like the system said that in regular classes he talks "a lot," but this was "too impersonal" and he was never observed interacting.

Another concern was how the receive site students felt about using their microphones. When a student at a remote site presses the mic and speaks, the classroom where they are located appears on the monitor at the back of the class. The teacher could touch the computer screen to display that class on all monitors, but this teacher rarely did so. So, when receive students spoke, their voices were heard but they were not seen. Some students would simply ask a question or make a response, others would preface it with the teacher's name. Beth explained what is was like speaking from a receive site.

> Beth: I feel I might be interrupting someone else. In my other class on the system, the teacher will ask a particular person, so everyone isn't hopping in at the same time. It would be easier to raise your hand. When you're verbally interrupting it seems rude. If they slow down or pause I'll ask if it seems like a good spot.

<u>"I won't tell your parents": Encouraging student interaction</u>

As in a traditional classroom the teacher can set the tone for how much interaction he or she expects of the students.

During one observation, the teacher encouraged students to talk by saying, "Come on, you're not being taped. I won't tell your parents." This encouraged response from the origination site classroom. One response also came from a remote site.

When examining interaction between students at each site an attempt was made to get a feel for classroom "community." Did the students feel any connection with those at the origination site?

At the main site, there was a cluster of three students (one male and two female) who often carried on conversations with each other during the instructional period. Two males who sat together were the most vocal in the class and interacted with each other as well. Two females who sat together interacted with each other but rarely with the teacher. Other than these three clusters, there did not seem to be much interaction between students. In the classes observed, the students did little talking with one another before class.

The teacher would arrive one or two minutes before air time and would display each remote site on the monitor at the back to make sure they were on the system and would usually say something and ask them to respond. The teacher would then lecture, occasionally ask for response, then remain after class to be accessible for questions from the origination site students.

During a final observation, interactions with the teacher during a 50 minute period were counted and recorded. Thirteen students were present at the origination site. Six of them interacted at least once. There were 21 interactions with a

microphone (nine from one student) and eight interactions without a microphone. There were no interactions with any of the remote sites that day. This was fairly typical of past observations except that remote sites in the past had at least one interaction per site. One other exception was the first observation where the number of interactions was much higher overall. In reviewing the data, this might be attributed to the topic being more relevant to student experiences.

Each of the remote sites observed had a different classroom climate. At one, the students rarely interacted with one another. When asked if this were typical, Sara confirmed that "we don't talk to each other much. We usually get there just in time and have to leave right away."

At the other remote site, the students seemed to have developed quite a comraderie. They interacted frequently with each other as evidenced by the earlier dialogue of Janet, Bill, and Karen. Janet confirmed in an interview that this was typical.

There was no indication of classroom community developing inclusive of all sites. Only one interaction was observed between students at separate sites when Sam said "Hello" to one of the receive site students. Jill's comment that she felt she could greet a receive site student on the street was not echoed by any one else. Following are some typical comments concerning how well the students feel they know each other.

Carol: I don't really feel any connection with the remote students at all. I think it would be hard on them.

Sam: I can talk to anyone. I may not know their names though.

Beth: I don't feel I know the people at the main site at all. That's one thing you don't get. To get to know people. When the other sites are speaking we usually don't get to see them. I don't know who's who. I can't say "What's your name?" on the mic every time someone talks. I'd like to see the other people talking more, but I realize it's extra work for the instructor.

Janet: You're not going to get as much out of class 30 miles away. You're not going to get to know them.

Because the teacher decides which camera is displayed on the classroom monitors, he or she controls how much the students see of each other. During observations, the teacher showed the origination site classroom to all sites only once and never showed the remote sites on the front monitors. The teacher was not observed using any techniques to encourage discussion between sites or between students within each site. The teacher occasionally called a student by name at a receive site, but usually referred to the sites by the name of the town and did not call any students in the origination site by name during the observations.

Discussion

The primary goal of this research was to explore communication from students' perspective of what it is like to learn in a live interactive television classroom. As is true of more traditionally taught courses, student experiences will vary

with the subject being taught, the personality, experience, and teaching methods of the instructor, and the student make-up of the class.

Even though classrooms, students, and teachers will vary, the experiences shared by the learners in this course can tell us a great deal about what we will need to do to create a learning environment via fiber-optic technology.

As stated in the literature review, teachers have not yet learned to tap into the potential of the system (ISEA, October 1993). As they do it will be important to keep in mind the needs and issues of importance to students.

Technical problems in this "Frontierland" are a student concern. Although most expressed a tolerance during this initial phase of "getting the bugs out," that tolerance may wear off once the system has been in place. The problems of not having audio or getting screeching feedback were quickly corrected when a technician was available. It seems a necessary expense for the origination site to always have someone available for this purpose.

The problem of not having enough time on the air to discuss questions after class with remote site students cannot be solved by increasing air time. As the system fills with classes, there will not be any extra time available. However, teachers can encourage students to call them with questions. To allow for equal access to the teacher, a toll-free number could be offered so that lower income students or those who live farther away are not at an economic disadvantage.

One student said the technology made the class too impersonal but wasn't able to elaborate enough to understand what he meant. It is possible his previous telecommunications course at another institution had been a negative experience that prejudiced him against this one. His view, however, seems consistent with any class where the teacher never calls a student by name, which was true of this one. His comment serves as an excellent reminder that students need to feel a personal connection.

Problems with distance also surfaced as students complained about not having handouts before class and not getting tests back before the class discussed them. Fax machines add expense, but are essential if we are truly committed to serving student needs. E-mail capabilities would add another avenue for more timely student-teacher interaction.

The use of library resources can also be a problem associated with distance learning. If we are concerned about equal access as the literature suggests we should be, then we cannot disadvantage rural students by denying them equal access to resources. We may believe we are providing equitable technology, by putting all students within 20 miles of a learning center. But, it is not truly equitable if we are not providing them with the same resources. Since this statewide system eventually plans to include libraries and government agencies this problem may eventually be solved. In the meantime, teachers need to be aware of this potential problem when giving assignments.

As some needs are specific to the rural populations, others seem to be of special concern to the non-traditional students. Students who were returning to their education expressed that they were "there to learn" and got frustrated when the topic got off course or when younger students goofed off or argued with the teacher. There were some older students in the origination site classroom, but it appears that this population will be increasing as more telecommunication courses are offered, if the students in this study are an indication. All of the remote site students interviewed in this study were adults returning to education. Most of them, as well as the non-traditional student interviewed at the main site, expressed some frustration over "these young kids." Although this may occur in traditional classrooms, it is one of the issues that telecommunication teachers need to be aware of as a concern of this increasing segment of the student body.

Another frustration expressed by remote students was when the origination site students didn't use their microphones. One student said he sometimes didn't use it because he didn't necessarily want everyone to hear. But, another reason was that it wasn't worth the trouble of reaching for it. He usually shared the mic with two other people and during one of the observations there were no mics at his table at all. Though it might be better to have a mic for each student, the cost factor is likely prohibitive. However, the instructor can see that the seating and placement of mics is arranged so no more than two students are sharing one microphone. If it is placed between

them, the sharing should not be a problem.

The teacher may get tired of saying "use your mic" but realizing how important it is to the remote students should be an incentive. One instructor at the institution has traveled to a remote site for at least one class period and originated from there instead. This not only gave the remote students a chance to meet the teacher but gave the usual origination site students an opportunity to discover what it was like to be in the remote site position. This appears to be an effective way to increase student awareness of the importance of using the mics.

The teacher plays an integral part in the encouragement of using the microphones, and also interaction in general. The literature review indicated interaction is essential (Pelton, 1990; Kruh & Murphy, 1990;), though not as much so for adults (Threlkeld, 1990).

If interaction is to take place, the teacher must encourage it. It seems likely that students who feel they know each other would be more inclined to interact. The teacher controls what will be seen on the monitors. If the students rarely see one another (as was true in this class) it's no wonder that they didn't feel they knew each other. When students at the origination site spoke, they were rarely transmitted on the monitors and none was called by name. When the receive sight students spoke, their classroom was rarely seen. Their names were rarely used except at the beginning of class when checking the system. One remote student said, "...it's more work for the teacher to show us who's talking." It's also more work to

memorize students' names. But, research on classroom climate and immediacy would indicate it is worth the effort.

The issue of interaction also needs further exploration. Is it true that interaction is not important to adult learners, or are other issues just more urgent? Is interaction important across all subject areas? Can all subject areas even be successfully taught over the system?

This study only touches on the subject of classroom community and the effect that technology and distance have on a personal classroom climate. Should remote students be required or encouraged to visit the main campus? Should teachers be expected to visit or transmit from remote sites? Would these things foster classroom community?

Summary

Fiber-optics technology brings both new opportunities and new concerns to the classroom. Numerous studies have researched various aspects of communication in educational settings. It remains to be seen, however, whether results of research from a traditional classroom will hold true for the interactive television classroom.

Results of this study indicate that further exploration is needed in communication-related areas such as classroom climate, apprehension, interaction, feedback, and learning styles.

The use of telecommunication technology alters classroom climate. Classrooms, particularly at the remote sites, may be composed of only one or two students. Some students will never meet one another and will not even see one another unless the

teacher is intentional about displaying all classrooms on the monitors. Will it be possible to foster classroom community in these situations and is classroom community an important issue in mediated classrooms? Teachers who find value in cooperative learning strategies and group projects will find this situation to be a challenge.

Remote students will not be interacting face-to-face with the instructor. Will students who are uncomfortable with technology be discouraged from interacting? Or could technology actually encourage apprehensive students to be more expressive since they are not face-to-face?

Frustrations were expressed in this study by students concerned about the promptness of feedback. Is this a problem common to distance learning?

All remote students in this study were nontraditional students. Is this true of other college courses being taught over the telecommunications system? Will the branching out of educational access result in a more diverse student population? If either of these is true, will teaching and communication strategies be affected?

A key question in further research will be: How much of what we have concluded to be true of communication in the traditional classroom will hold true when students are separated by distance and linked together by technology?

References

Duning, B. S. , Van Kekerix, M. J. , & Zaborowski, L. M. (1993). Reaching learners through telecommunications. San Francisco: Jossey-Bass Publishers.

Garrison, D. R. (1990). An analysis and evaluation of audio teleconferencing to facilitate education at a distance. The American Journal of Distance Education, 4(3), 13-24.

Hartman, H. (1994, March 20). Fiberoptics unites schools. The Des Moines Register, p. 1.

Iowa Communications Network (ICA). (1993). Information highways of the future. (Available from Iowa Public Television, Educational Telecommunications, P.O. Box 6450, Johnston, IA 50131.)

Iowa Distance Education Alliance (IDEA). (1993, May). Partnerships for interactive learning through telecommunications in Iowa's elementary and secondary schools. (84.203B Star Schools-Special Statewide Network)

Iowa State Education Association (ISEA). (1993, October). ISEA Communique, 31,(2), p. 1. (Available from the Iowa State Education Association, 4025 Tonawanda Drive, Des Moines, IA 50312)

Kabat, E. J. (1991, August). The Eastern Iowa Community College District's (EICCD) Televised Interactive Education (TIE) evaluation report. Eastern Iowa Community College District: District Office of Academic Affairs and Planning.

Kruh, J., & Murphy, K. (1990, October). Interaction in teleconferencing: the key to quality instruction. Paper presented at the Annual Rural and Small Schools Conference, Manhattan, KS. (ERIC Document Reproduction Service No. ED 329 418)

O'Hara, L. & Patton, S. (1992). A rural communiversity: teaching developmental through graduate courses via two-way video. Paducah, Kentucky: Paducah Community College.

Rezabek, R. J. (1988). Teleteaching handbook: A handbook for teachers using microwave or ITFS interactive instruction. Fort Dodge, IA: Arrowhead Area Education Agency.

Threlkeld, R. M., Behm, R. J., & Shiflett, M. (1990, August). Live and interactive: Is it really important? In C. C. Gibson (Ed.). Echoes from the future: Challenges for new learning systems. Proceedings of the Annual Conference on Distance Teaching and Learning, Madison, WI: University of Wisconsin. (ERIC Document Reproduction Service No. ED 340 353.)

U.S. Congress, Office of Technology Assessment. (1989, November). Linking for learning: A new course for education (Report no. OTA-SET-430). Washington D. C.: U.S. Government Printing Office

Vice President Gore unveils information highway plan. (1994, January 12). The Des Moines Register, p. 4).